

CLAIMS

1. Component for a static micromixer in the form of a disk (1) which
 - has at least one inlet opening (2) for the introduction of at least one feed stream into a linking channel (3) disposed in the plane of the disk and at least one outlet opening (4) for the outflow of the feed stream into a mixing zone (5) disposed in the plane of the disk,
 - wherein the inlet opening (2) is connected with the outlet opening (4) in a communicating manner through the linking channel (3) disposed in the plane of the disk, and
 - wherein the linking channel (3) before opening into the mixing zone (5) is divided by microstructure units (6) into two or more part channels (7), the widths of the part channels being in the millimeter to submillimeter range and being smaller than the width of the mixing zone (5).
2. Component as defined in claim 1, characterized in that the widths of the part channels (7) at their opening into the mixing zone are from 1 µm to 2 mm.
3. Component as defined in claim 1 or 2, characterized in that the ratio of the greatest width of the linking channel (3) and/or of the width of the inlet opening (2) to the width of the part channels (7) is greater than 2.
4. Component as defined in one of the preceding claims, characterized in that the ratio of the length to the width of the part channels (7) is from 1:1 to 20:1.
5. Component as defined in one of the preceding claims, characterized in that the ratio of the width of the mixing zone (5) to the width of the part channels (7) is greater than 2.
6. Component as defined in one of the preceding claims, characterized in that additionally it has at least one flow-through opening (9).
7. Component as defined in one of the preceding claims, characterized in that at least one of the inlet openings (2) or flow-through openings (9) or the mixing zone (5) is enclosed by the plane of the disk and that the linking channel (3) is formed by an indentation.
8. Component as defined in one of the preceding claims, characterized in that at least one of the inlet openings (2) or flow-through openings (9) or the mixing zone (5) is disposed at the edge of the disk or as a recess at the edge of the disk.

9. Component as defined in one of the preceding claims, characterized in that there are present at least two inlet openings (2) for at least two different feed streams, each inlet opening (2) being connected with the mixing zone (5) through the linking channel (3).

10. Component as defined in claim 9, characterized in that there are present two inlet openings (2) for two different feed streams, each inlet opening (2) being connected with the mixing zone (5) through one linking channel (3) and the outlet openings (4) of the two linking channels (3) being disposed opposite one another.

11. Component as defined in one of the preceding claims, characterized in that the outlet openings (4) are arranged on a circular line.

12. Component as defined in one of the preceding claims, characterized in that it has additional through-holes (12) and additional part channels (13) the latter being integrated into the microstructure units (6) and being separated from the part channels (7).

13. Static micromixer which has

- a housing (11) with at least 2 fluid inlets (12a) and at least one fluid outlet (16) and
- at least two disks as defined in one of claims 1 to 12 arranged into a stack in the housing (11),
- wherein the disks (1) are superposed on one another so that the inlet openings (2) form subsidiary channels for introducing a particular feed stream and the mixing zones (5) form a main channel for removing the product stream, and the main and subsidiary channels extend through the stack.

14. Micromixer as defined in claim 13, characterized in that the linking channels (3) of the disks (1) are formed by indentations and that the linking channels (3), before opening into the mixing zone (5), are divided into part channels (7) by the microstructure units (6) provided on the disks.

15. Micromixer as defined in claim 13, characterized in that the linking channels (3) of the disks (1) are formed by recesses in the disks (1), the disks (1) being arranged as intermediate disks between a cover disk and a bottom disk, and that the linking channels (3) before opening into the mixing zone (5) are divided into part channels (7) by microstructure units (6) provided on the cover disks and/or bottom disks.

16. Micromixer as defined in one of claims 13 to 15, characterized in that it has an integrated heat exchanger.

17. Combustion reactor having a micromixer with at least one component as defined in one of claims 1 to 12, at least one first connection for introducing a combustible liquid or gaseous medium, and at least one second connection for introducing a combustion reaction-promoting medium.

18. Mixing process whereby at least two fluid feed streams, at first kept separated, are mixed with each other, characterized in that the mixing is carried out by use of at least one component as defined in one of claims 1 to 12 or at least one static micromixer as defined in one of claims 13 to 16.

19. Process as defined in claim 18, characterized in that the flow rate at which the feed stream is fed to the mixing zone is greater than the flow rate of the product stream within the mixing zone.

20. Process for producing dispersions or solutions whereby a continuous liquid phase is mixed with at least one insoluble fluid phase that is to be dispersed or with at least one soluble fluid phase, characterized in that the mixing is carried out by use of a component as defined in one of claims 1 to 12 or by use of at least one static micromixer as defined in one of claims 13 to 16.

21. Process as defined in claim 20, characterized in that the continuous phase is conveyed through the main channel and the phase to be dispersed or dissolved is conveyed through at least one subsidiary channel of a micromixer as defined in one of claims 13 to 16.

22. Process for carrying out chemical reactions whereby

- at least two fluid feed streams, at first kept separated, and which contain or consist of reactive constituents are mixed with one another and whereby
- during or after the mixing a chemical reaction takes place among the constituents spontaneously or induced by a supply of energy or by a suitable catalyst,

characterized in that the mixing is carried out by use of at least one component as defined in one of claims 1 to 12 or of at least one static micromixer as defined in one of claims 13 to 16.

23. Use of microcomponents as defined in one of claims 1 to 12 for mixing, homogenizing, dispersing, emulsifying, dissolving or gassing liquids or for carrying out chemical reactions.